

## Press release

### Ideas for Mobility of the Future

**“Freudenberg Award – Mobility” bestowed on three engineers.**

**Weinheim, Thursday, December 16, 2021. To promote new initiatives in mobility – that is the goal of the “Freudenberg Award – Mobility,” which was bestowed in Karlsruhe yesterday. Every two years, the technology company Freudenberg honors scientific contributions made by graduates of the Karlsruhe Institute of Technology in the field of Mobility Systems. Freudenberg and the jury awarded the distinctions to this year’s three prize-winners, Jairo Inga Charaja, Ph.D in engineering, Martin Eisele, Ph.D in engineering and Stefan Scheubner, Ph.D. in engineering.**

**Press contact**

Martina Muschelknautz

Corporate Communications

Freudenberg & Co. KG

Tel. +49 06201 80-6637

Fax+49 06201 88-6637

[martina.muschelknautz@freudenberg.com](mailto:martina.muschelknautz@freudenberg.com)

How can the interplay of drivers and assistance systems be improved? Can the optimal cooling of a battery be modeled at an early stage? And how can charging breaks be calculated more reliably in advance? These are the topics that three young engineers chose for their dissertations, recently completed at the Karlsruhe Institute for Technology. On behalf of the Freudenberg-Group and the jury, Dr. Niko Reuss, Head of Freudenberg Technology Innovation (FTI), Dr. Fernando Portela-Cubillo, Head of Future Technologies at FTI, and Dr. Julia Kubasch, Head of Public Funding at FTI, together with Prof. Albert Albers, Spokesperson for the Management Board of the Institute for Product Design, Development, and Engineering (IPEK) and Deputy Scientific Spokesperson of Mobility Systems Center, bestowed the “Freudenberg Award – Mobility” on the three scientists. The distinction, which

had up to now been awarded under the name of the Carl Freudenberg Prize, emphasizes with its change of name the existing focus on the field of mobility systems.

The first-place winner, Jairo Inga Charaja, Ph.D in engineering, focused his efforts on the contact between people and machines. “I wanted to bring people back to the forefront, and so I created a mathematical model that describes human behavior during physical interaction with a machine,” said the engineer. His findings will make it possible to program machines to be more human-friendly in the future. A concept that could be applied to improve driver assistance systems, among other possible applications. “I am extremely grateful for this prize,” explained the Peruvian-born engineer after the award ceremony. “I’m delighted to have been allowed to research the topic and am thrilled to have been recognized for it!”

A functional battery cooling system is a key factor for the success of electro-mobility. Thanks to the research project of Martin Eisele, Ph.D in engineering, battery cell temperature control will be able to be modeled and tested at a very early developmental stage in the future. “This enables different cooling designs to be tested and analyzed before considerable money is spent on measuring battery cells and creating physical prototypes,” explains the mechanical engineer who was awarded the second-place prize. “I am very proud to be selected, and I hope that my project contributes to developing even more efficient electric vehicle battery systems,” said Eisele.

Stefan Scheubner, Ph.D. in engineering, in contrast, improved the calculation of the operating range of an electric vehicle: “My goal was to calculate more precisely in advance when and how long an electric vehicle must be charged on a predetermined route,” he explains. His algorithm learns from driver and traffic data, making

it possible to offer more precise individual predictions. The engineer intends to use this development to reduce the uncertainty that continues to deter people from buying electric vehicles. “The issue of ‘anxiety about operating range’ will soon become a thing of the past,” says the third-place finalist, whose research findings are already being used in a vehicle model of a major German automaker.

### **The winners for 2021:**

- Jairo Inga Charaja, Ph.D in engineering: “Inverse Dynamic Game Methods for Identification of Cooperative System Behavior”
- Martin Eisele, Ph.D in engineering: “Development of a validation environment for the design of battery module cooling concepts in the early phase of product development”
- Stefan Scheubner, Ph.D. in engineering: “Stochastic Range Estimation Algorithms for Electric Vehicles using Data-Driven Learning Models”

### **About the Freudenberg Award – Mobility**

The prize, which includes a monetary award of €10,000, serves to promote the talent of younger scientists working in the area of Mobility Systems at the Karlsruhe Institute for Technology (KIT). It is awarded every two years for the best academic project in science and engineering in the field of “Mobility Systems and their Integration and Interaction in Society.” The winners were selected by an interdisciplinary committee from the KIT using the criteria of scientific excellence and potential industrial usefulness.

The Carl Freudenberg Prize, and its successor, the Freudenberg Award – Mobility, has been bestowed since 1951. The Freudenberg Group endowed this prize in 1949, on the occasion of the 100th anniversary of its establishment. The prize was originally given the former company name, “Carl Freudenberg,” by the CEO at that time, Hans Freudenberg (1888-1966), who was the grandson of the founder Carl Freudenberg. As a former assistant professor, and then as honorary senator, Hans Freudenberg was closely associated with the University throughout his life. In 2021, the Carl Freudenberg Prize was renamed the Freudenberg Award – Mobility to emphasize the relationship with the Freudenberg Group while also reflecting more clearly the existing focus of the prize on the field of Mobility Systems. It is part of the company’s social responsibility to the region around its historic headquarters in Weinheim.

### **About the Freudenberg Group**

Freudenberg is a global technology group that strengthens its customers and society long-term through forward-looking innovations. Together with its partners, customers and research institutions, the Freudenberg Group develops leading-edge technologies and excellent products and services for about 40 markets and for thousands of applications: seals, vibration control components, technical textiles, filters, cleaning technologies and products, specialty chemicals and medical products.

Innovation strength, strong customer orientation, diversity, and team spirit are the cornerstones of the Group. The 170-year-old company lives by its core values: a commitment to excellence, reliability and pro-active, responsible action.

In 2020, the Freudenberg Group employed some 48,000 people in around 60 countries worldwide and generated sales of roughly €8.8 billion. For more information, please visit [www.freudenberg.com](http://www.freudenberg.com).